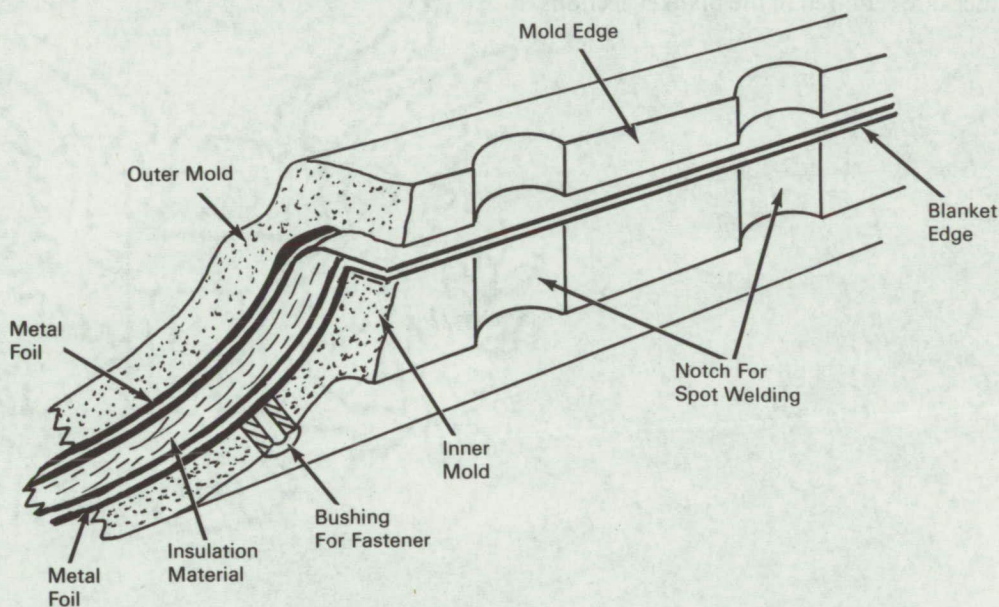


NASA TECH BRIEF



NASA Tech Briefs are issued to summarize specific innovations derived from the U. S. space program and to encourage their commercial application. Copies are available to the public from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia 22151.

Spray-On Technique Simplifies Fabrication of Complex Thermal Insulation Blanket



The problem:

To develop a technique that would simplify the fabrication of thermal insulation blankets. Present tooling techniques require many individual tools and jigs; for example, forming the blanket components for the F-1 engine involves approximately 1,000 different parts of varying sizes and shapes.

The solution:

A spray-on process for constructing molds to be used in forming sections of thermal insulation blankets.

How it's done:

The surface of the object requiring a thermal insulation blanket is divided into convenient sections. For

each section, a plaster form or mock-up having the same surface contours as the original is prepared for use as a pattern. A parting agent is first applied to the surface of the pattern, after which a plastic material such as epoxy resin with chipped glass fibers is sprayed on with a standard spray gun. The mat of wetted fibers is then compacted using a hand roller, and more of the same material is applied until the desired thickness is obtained. This shell is removed after hardening and becomes the inner mold for forming the blanket section; it is also used as the form for the preparation of the outer mold. This is accomplished by first appropriately padding the smooth surface of the inner mold to

(continued overleaf)

simulate the insulation material used in blanket fabrication. Then, a parting agent is applied to the resulting surface, followed by a sprayed-on epoxy resin coating and a repeat of the final treatment used previously in producing the inner mold from the plaster form. As the two mold sides are positioned now, they also will be positioned when the blanket is formed, but then they will be clamped together to shape the blanket materials replacing the dummy padding.

Blanket sections typically consist of sheets of metal foil on either side of an insulation material such as aluminized asbestos, glass fiber batting, or the like. Metal foil, with an embossed pattern, lends itself to intricate shaping. Edges of a blanket section are sealed by spot and seam resistance welding. The spot welding is facilitated by notches cut at the edges of the mold section to accommodate the welding equipment. Where holes for grommets are required in the blanket sections

so that the sections may be positioned together with pins prior to lacing, drill bushings are embedded during the mold forming stages.

Note:

Inquiries concerning this innovation may be directed to:

Technology Utilization Officer
Marshall Space Flight Center
Huntsville, Alabama, 35812
Reference: B66-10053

Patent status:

No patent action is contemplated by NASA.

Source: R. Raymond and W. E. G. Bond
of North American Aviation, Inc.,
under contract to
Marshall Space Flight Center
(M-FS-497)